REMARKS

Claims 1-37 were pending in the application. Claims 1-4, 8-13, 19-22, and 26-31 stand rejected under 35 U.S.C. 103(a) as allegedly being unpatentable over "Probabilistic Fatigue Life Sensitivity Analysis of Titanium Rotors," M. Enright ("Enright,") in view of "Fracture Mechanics Analysis in DARWIN," R. Craig McClung ("McClung"). Claims 32-37 stand rejected as allegedly being anticipated by "Future Research Trends in Metal Plasticity for Simulation of Metals Processing and Life Cycle Engineering," D.L. McDowell ("McDowell"). Claims 5-7, 14-18, and 23-25 stand objected to.

Please cancel claims 19-31, without prejudice or disclaimer. Please add new claims 38-52.

In view of the amendments and remarks herein, the rejections are respectfully traversed. Reconsideration and allowance are respectfully requested.

Claim 1

Claim 1 has been amended to more clearly emphasize patentable features. Claim 1 is patentable over Enright and McClung because neither Enright or McClung teach or suggest "building an microstructure-based failure model for at least one said RVE," as recited in claim 1.

As the Examiner appears to acknowledge, Enright does not discuss Representative Volume Elements (RVE) or microstructure modeling of a node in a Finite Element Model (FEM).

The Examiner relies on Smit to support a statement that RVE are commonly used in FEM modeling, and would have knowingly been incorporated by a skilled artisan to represent a microstructure failure model. However, Smit does not teach a microstructure failure model. Rather, Smit only teaches using modeling at higher resolution to determine local stress with higher resolution. Smit does not teach a model for microstructure failure in an RVE.

Finally, the Examiner relies on McClung to show the use of crack growth mechanisms. Thus, McClung assumes the pre-existence of cracks, and addresses long crack propagation and final fracture. McClung does not teach a microstructure failure model.

Since Enright, Smit and McClung do not teach building an RVE microstructure-based failure model, their combination also does not teach an RVE microstructure-based failure model. Consequently, the Examiner has not made a prima facie case for obviousness.

New claims 41 and 47 are computer program product and system claims substantially similar to claim 1, and should be allowable for similar reasons.

Claim 32

Claim 32 calls for simulating a grain orientation of a material. The simulation includes using probabilistic methods to generate a slip plane normal angle for each at least one potential slip system, inputting the normal angle into the equations to obtain a potential orientation factor for each at least one potential slip system, and selecting the least said potential orientation factor as a grain orientation factor for the grain orientation.

McDowell does not teach such a simulation. The Examiner says McDowell discloses grain orientation and slip model equations. However, McDowell merely discusses needs for future research, and does not teach specific implementations of simulations (excepting general discussion of other publications on pages 3-4). McDowell does not teach using probabilistic methods to generate a slip plane normal angle, inputting the normal angle into the equations to obtain a potential orientation factor for each at least one potential slip system, or selecting the least said potential orientation factor as a grain orientation factor for the grain orientation. Pages 3, 7 and 13 do not appear to discuss grain orientation. Although page 4, paragraph 3 of McDowell mentions orientation distribution of grains, it does not discuss using probabilistic methods to generate a slip plane normal angle for each at least one potential slip system, inputting the normal angle into the equations to obtain a potential orientation factor for each at least one potential slip system, and selecting the least one potential orientation factor as a grain orientation factor for the grain orientation.

Since not all the elements of claim 32 are shown by the reference, the claim cannot be anticipated.

In view of the foregoing, applicant respectfully requests reconsideration and allowance of claims 1-18 and 32-52.

Please charge the fee of $150 to Deposit Account No. 06-1050 for excess claim fees. Please apply any other charges or credits to deposit account 06-1050.

Respectfully submitted,

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